

Claims

5 1. Hydrocarbon exploration system, comprising a first vessel (1) having a turret (3) around which the vessel can weathervane, the turret being moored to the sea bed, and a second vessel (7, 8) connected with at least one riser (12) to a subsea well (5, 6), the first vessel being connected to the second vessel via a fluid transfer duct (20, 21) comprising a first end section (23) attached to the turret (3) of the first vessel (1), a substantially horizontal mid section (24), and a second end section (22) attached at or near the second vessel (7, 8), characterised in that, the second vessel (7, 8) has no large hydrocarbon storage facilities and a hull weight of between 2,000 and 15,000 ton) and comprises an upper structure (13) and a submerged base (15) to which second vessel (7,8)) the riser (12) is connected, the base (15) being attached to the sea bed via taut tendons (9, 10), the weight exerted by the fluid transfer duct (20, 21) on the second vessel (7, 8) being below 1,000 ton, a power generator (35) being situated on the first vessel (1), power being transferred from the power generator (35) via an electrical swivel (38) on the first vessel, to a power supply cable, the power supply cable (39, 40) extending along the fluid transfer duct (20, 21) from the first vessel (1) to the second vessel (7, 8), and being supported at least partly by the fluid transfer duct (20,21).

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2. Hydrocarbon exploration system according to claim 1, wherein at least one further vessel (7, 8), of similar type as the second vessel (7, 8), is attached to the first vessel (1) via a respective fluid transfer duct (20,21) in a similar manner as the second vessel (7, 8).

3. Hydrocarbon exploration system according to claim 1 or 2, wherein the second vessel (7, 8) has a central part (16) and at least three transverse mooring arms (17, 18, 19), radially extending from the central part (16).

4. Hydrocarbon exploration system according to claim 1, 2 or 3, an anchor line (30, 31, 32, 33) extending from the sea bed (4) to the second end section (22) of the horizontal mid section (24), at an angle to the vertical.

5. Hydrocarbon exploration system according to claim 1, 2, 3 or 4, wherein buoyancy elements (55, 56) are placed locally along the horizontal mid section of the transfer duct (45), the horizontal section extending along a curved trajectory.

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6. Hydrocarbon exploration system according to claim 4, wherein a buoyancy member (26, 27) is attached to the first end section (23) of the fluid transfer duct (20, 21), a second anchor line (31, 33) being attached to the seabed (4) and the first end section (23) at an angle with the vertical.

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7. Hydrocarbon exploration structure according to claim 3, the end part of the fluid transfer duct being attached to a vertical arm (17, 18, 19).

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8. Hydrocarbon exploration system, comprising a first vessel having a turret around which the vessel can weathervane, the turret being moored to the sea bed, and a second vessel connected with at least one riser to a sub sea well, the first vessel being connected to the second vessel via a fluid transfer duct, characterised in that the second vessel has no large hydrocarbon storage facilities and a hull weight of between 2,000 and 15,000 ton, and comprises an upper structure and a submerged base, a power generator being situated on the first vessel, a power supply cable extending from the first vessel to the second vessel, the power supply cable being attached to the power generator via an electrical swivel on the turret of the first vessel.

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9. Hydrocarbon exploration system according to claim 8, wherein the fluid transfer duct comprises a first end section attached to the first vessel, a second end section attached to the second vessel and a substantially horizontal mid section situated above the sea bed, the power supply cable extending along the fluid transfer duct and being at least partly supported by the fluid transfer duct.

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10. Hydrocarbon exploration system according to claim 8 or 9, wherein a tensioning cable extending at an angle to the vertical, or a clump weight is attached to at least one of the end sections of the fluid transfer duct, exerting a downward force component on

the end section, the end section being supported by a buoyancy element or by a support cable attached to the first and/or second vessel extending at an angle to the vertical.

11. Hydrocarbon exploration system according to claim 8, 9 or 10, wherein at least 5 one further vessel (7, 8), of similar type as the second vessel (7, 8), is attached to the first vessel (1) via a respective fluid transfer duct (20,21) in a similar manner as the second vessel (7, 8).
- 10 12. Hydrocarbon exploration system according to claim 8,9, 10 or 11, wherein buoyancy elements (55, 56) are placed locally along the horizontal mid section of the transfer duct (45), the horizontal section extending along a curved trajectory.